REMARKS

This paper is responsive to a Non-Final Office action dated April 4, 2006. Claims 1-43 were examined. Claims 1-10, 14-16, 18-35, 37, and 39-43 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,377,082 B1 to Loinaz et al. Claims 11-13 and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Loinaz as applied to claims 1, 9-10 and 30 above in view of U.S. Patent No. 6,492,929 B1 to Coffee et al

Specification

The specification is amended to be consistent with the figures.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-10, 14-16, 18-35, 37, and 39-43 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,377,082 B1 to Loinaz et al., (hereafter, "Loinaz"). Regarding claim 1, Applicants respectfully maintain that Loinaz, alone or in combination with other references of record, fails to teach or suggest

> comparing signal strength of a plurality of data bits of an input data stream to a signal strength threshold level and generating an indication thereof and determining a count value according to the indication,

as required by claim 1. Applicants respectfully point the Examiner to Figures 1, 3, 4 and page 4, lines 9-16 which states:

> The loss-of-signal (LOS) system utilizes a sampled-data approach, which samples the input data at regular intervals and compares the magnitude of the sampled input data to a threshold signal strength level. If the number of samples that have a signal strength above the signal strength threshold exceeds a count threshold, then a LOS indication is not asserted. However, if the number of samples with signal strength greater than the

threshold is less than the count threshold, then the LOS indication is asserted, thereby indicating that the LOS condition exists.

In addition, page 11, lines 16-17, of the specification states that "[e]ach time the high-speed register 115 samples the input it will output a digital high if the signal strength is greater than the LOS threshold." In contrast to claim 1, Loinaz teaches transition detector 201 that detects the number of 0-1 and 1-0 transitions and producing a high output signal if less than K transitions are detected over a specified time period, thus indicating a stuck-at-zero or stuck-at-one condition. Col. 2, lines 9-20. Loinaz also teaches a peak detector 203 that estimates a peak value of an input data signal, which is subtracted from an LOS threshold signal to generate an output signal indicating an LOS if the peak signal falls below an LOS threshold value. Col. 2, lines 21-41. The outputs of peak detector 203 and transition detector 201 of Loinaz are logically ORed to generate an LOS indicator. Col. 2, lines 52-57.

Loinaz teaches further that difference signals are sampled to generate decision circuit output signals, which are decisions of whether the sampled data is a logic '1' or a '0' based on comparison to a decision threshold signal. Col. 4, lines 51-35-50. The decision threshold signal of Loinaz may be set to the midpoint between logic '0' and logic '1', or the midpoint offset by a delta. Col. 1, lines 20-26; col. 4, lines 41-50. The decision circuit output signals of Loinaz are used to generate inconsistency signals, which are then counted to determine an LOS condition. Col. 4, line 51- col. 5, line 10. Applicants respectfully maintain that the difference signals, decision threshold signals, and decision circuit output signals of Loinaz fail to teach or suggest signal strength, signal strength threshold levels, or indications as claimed. Applicants respectfully point the Examiner to at least the specification page 4, lines 8-24 and page 7, lines 12-20, which describe signal strength. Nowhere does Loinaz teach or suggest determining a count value according to an indication of a comparison of signal strength of a plurality of data bits of an input data stream to a signal strength threshold level, as required by claim 1. For at least this reason, Applicants respectfully maintain that claim 1 distinguishes over Loinaz and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 1 and all claims dependent thereon, be withdrawn.

Regarding claim 2, Applicants respectfully maintain that Loinaz, alone or in combination with other references of record, fails to teach or suggest

> sampling the input data stream to obtain the plurality of data bits, a sampling rate of the sampling being below a data rate of the input data stream,

as required by claim 2. Applicants respectfully point out that "[a] single prior art reference anticipates a patent claim if it expressly or inherently describes each and every limitation set forth in the patent claim." Trintec Indus., Inc. v. Top-U.S.A. Corp., 295 F.3d 1292; 63 U.S.P.Q.2d (BNA) 1597 (Fed. Cir. 2002) (emphasis added) (citing Verdegaal Bros. v. Union Oil Co. of Cal., 814 F.2d 628, 631, 2 U.S.P.Q.2d (BNA) 1051, 1053 (Fed. Cir. 1987). The Office states that it is well known to a person of skill in the art that the frequency of VCO 126 of Loinaz within a PLL circuit is sometimes frequency divided/multiplied by an integer value of a divider/multiplier for frequency integrating/interpolating the sampling rate of the oscillation frequency. Even if the Office can provide a reference(s) in support of that position and explain how the reference(s) can be properly combined with Loinaz to teach a frequency divided VCO of Loinaz, such a combination fails to teach or suggest sampling the input data stream to obtain the plurality of data bits, a sampling rate of the sampling being below a data rate of the input data stream, as required by claim 2. For at least this reason, Applicants respectfully maintain that claim 2 distinguishes over Loinaz and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 2 and all claims dependent thereon, be withdrawn.

Regarding claim 6, Applicants respectfully maintain that Loinaz, alone or in combination with other references of record, fails to teach or suggest that

> generating the loss-of-signal indication comprises comparing the count value to a threshold count, and the threshold count varies according to an indication of the signal strength threshold level,

as required by claim 6. The Office relies on transition detector 301 of Loinaz to supply this teaching. Transition detector 301 of Loinaz detects the number of 0-1 and 1-0 transitions and

produces a high output signal if less than K transitions are detected over a specified time period. Col. 2, lines 9-20. Nowhere does Loinaz teach that a threshold count varies or that the threshold count varies according to an indication of the signal strength threshold level, as required by claim 6. For at least this reason, Applicants respectfully maintain that claim 6 distinguishes over Loinaz and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 6 and all claims dependent thereon, be withdrawn.

Regarding claim 7, Applicants respectfully maintain that Loinaz, alone or in combination with other references of record, fails to teach or suggest that

> generating the loss-of-signal indication comprises comparing the count value to a threshold count, and the threshold count varies to provide hysteresis in generating the loss-of-signal indication,

as required by claim 7. The Office relies on transition detector 301 of Loinaz to supply this teaching. Transition detector 301 of Loinaz detects the number of 0-1 and 1-0 transitions and produces a high output signal if less than K transitions are detected over a specified time period. Col. 2, lines 9-20. Nowhere does Loinaz teach that a threshold count varies or that the threshold count varies to provide hysteresis in generating the loss-of-signal indication, as required by claim 7. For at least this reason, Applicants respectfully maintain that claim 6 distinguishes over Loinaz and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 7 and all claims dependent thereon, be withdrawn.

Regarding claim 28, Applicants respectfully maintain that Loinaz, alone or in combination with other references of record, fails to teach or suggest

> determining for a plurality of data bits of an input data stream whether a signal strength of each of the data bits is above or below a signal threshold level and determining that the loss-of-signal condition exists if a predetermined number of the data bits have a signal strength below the signal threshold level,

as required by claim 28. Applicants respectfully point the Examiner to Figures 1, 3, 4 and page 4, lines 9-16 which states:

> The loss-of-signal (LOS) system utilizes a sampled-data approach, which samples the input data at regular intervals and compares the magnitude of the sampled input data to a threshold signal strength level. If the number of samples that have a signal strength above the signal strength threshold exceeds a count threshold, then a LOS indication is not asserted. However, if the number of samples with signal strength greater than the threshold is less than the count threshold, then the LOS indication is asserted, thereby indicating that the LOS condition exists.

In addition, page 11, lines 16-17, of the specification states that "[e]ach time the high-speed register 115 samples the input it will output a digital high if the signal strength is greater than the LOS threshold." In contrast to claim 28, Loinaz teaches transition detector 201 that detects the number of 0-1 and 1-0 transitions and producing a high output signal if less than K transitions are detected over a specified time period, thus indicating a stuck-at-zero or stuck-at-one condition. Col. 2, lines 9-20. Loinaz also teaches a peak detector 203 that estimates a peak value of an input data signal, which is subtracted from an LOS threshold signal to generate an output signal indicating an LOS if the peak signal falls below an LOS threshold value. Col. 2, lines 21-41. The outputs of peak detector 203 and transition detector 201 of Loinaz are logically ORed to generate an LOS indicator. Col. 2, lines 52-57.

Loinaz teaches further that difference signals are sampled to generate decision circuit output signals, which are decisions of whether the sampled data is a logic '1' or a '0' based on comparison to a decision threshold signal. Col. 4, lines 51-35-50. The decision threshold signal of Loinaz may be set to the midpoint between logic '0' and logic '1', or the midpoint offset by a delta. Col. 1, lines 20-26; col. 4, lines 41-50. The decision circuit output signals of Loinaz are used to generate inconsistency signals, which are then counted to determine an LOS condition. Col. 4, line 51- col. 5, line 10. Applicants respectfully maintain that the difference signals, decision threshold signals, and decision circuit output signals of Loinaz fail to teach or suggest signal strength, signal threshold levels, or indications as claimed. Applicants respectfully point

the Examiner to at least the specification page 4, lines 8-24 and page 7, lines 12-20, which describe signal strength. Nowhere does Loinaz teach or suggest determining that a loss-of-signal condition exists if a predetermined number of the plurality of data bits have a signal strength below the signal threshold level, as required by claim 28. For at least this reason, Applicants respectfully maintain that claim 28 distinguishes over Loinaz and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 28 and all claims dependent thereon, be withdrawn.

Regarding claim 29, Applicants respectfully maintain that Loinaz, alone or in combination with other references of record, fails to teach or suggest

> comparing a magnitude of the sampled input data to a threshold signal strength level and asserting a loss-of-signal indication if a number of samples, over a predetermined time period, having a signal strength less than the threshold signal strength level, is more than a predetermined value,

as recited by claim 29. Applicants respectfully point the Examiner to Figures 1, 3, 4 and page 4, lines 9-16 which states:

> The loss-of-signal (LOS) system utilizes a sampled-data approach, which samples the input data at regular intervals and compares the magnitude of the sampled input data to a threshold signal strength level. If the number of samples that have a signal strength above the signal strength threshold exceeds a count threshold, then a LOS indication is not asserted. However, if the number of samples with signal strength greater than the threshold is less than the count threshold, then the LOS indication is asserted, thereby indicating that the LOS condition exists.

In addition, page 11, lines 16-17, of the specification states that "[e]ach time the high-speed register 115 samples the input it will output a digital high if the signal strength is greater than the LOS threshold." In contrast to claim 29, Loinaz teaches transition detector 201 that detects the

number of 0-1 and 1-0 transitions and producing a high output signal if less than K transitions are detected over a specified time period, thus indicating a stuck-at-zero or stuck-at-one condition. Col. 2, lines 9-20. Loinaz also teaches a peak detector 203 that estimates a peak value of an input data signal, which is subtracted from an LOS threshold signal to generate an output signal indicating an LOS if the peak signal falls below an LOS threshold value. Col. 2, lines 21-41. The outputs of peak detector 203 and transition detector 201 of Loinaz are logically ORed to generate an LOS indicator. Col. 2, lines 52-57.

Loinaz teaches further that difference signals are sampled to generate decision circuit output signals, which are decisions of whether the sampled data is a logic '1' or a '0' based on comparison to a decision threshold signal. Col. 4, lines 51-35-50. The decision threshold signal of Loinaz may be set to the midpoint between logic '0' and logic '1', or the midpoint offset by a delta. Col. 1, lines 20-26; col. 4, lines 41-50. The decision circuit output signals of Loinaz are used to generate inconsistency signals, which are then counted to determine an LOS condition. Col. 4, line 51- col. 5, line 10. Applicants respectfully maintain that the difference signals, decision threshold signals, and decision circuit output signals of Loinaz fail to teach or suggest signal strength, threshold signal strength levels, or indications as claimed. Applicants respectfully point the Examiner to at least the specification page 4, lines 8-24 and page 7, lines 12-20, which describe signal strength. Nowhere does Loinaz teach or suggest asserting a loss-of-signal indication if a number samples, over a predetermined time period, have a signal strength less than the threshold signal strength level, is more than a predetermined value, as required by amended claim 29. For at least this reason, Applicants respectfully maintain that claim 29 distinguishes over Loinaz and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 29 and all claims dependent thereon, be withdrawn.

Regarding claim 30, Applicants respectfully maintain that Loinaz, alone or in combination with other references of record, fails to teach or suggest

> a sample circuit coupled to sample input data and store a first value when signal strength magnitude of the sampled input data is above a signal strength threshold level and store a second value when the

> signal strength magnitude of the sampled input data is below the signal strength threshold level and a counter circuit coupled to count according to an output of the sample circuit,

as required by claim 30. Applicants respectfully point the Examiner to Figures 1, 3, 4 and page 4, lines 9-16 which states:

> The loss-of-signal (LOS) system utilizes a sampled-data approach, which samples the input data at regular intervals and compares the magnitude of the sampled input data to a threshold signal strength level. If the number of samples that have a signal strength above the signal strength threshold exceeds a count threshold, then a LOS indication is not asserted. However, if the number of samples with signal strength greater than the threshold is less than the count threshold, then the LOS indication is asserted, thereby indicating that the LOS condition exists.

In addition, page 11, lines 16-17, of the specification states that "[e]ach time the high-speed register 115 samples the input it will output a digital high if the signal strength is greater than the LOS threshold." In contrast to claim 30, Loinaz teaches transition detector 201 that detects the number of 0-1 and 1-0 transitions and producing a high output signal if less than K transitions are detected over a specified time period, thus indicating a stuck-at-zero or stuck-at-one condition. Col. 2, lines 9-20. Loinaz also teaches a peak detector 203 that estimates a peak value of an input data signal, which is subtracted from an LOS threshold signal to generate an output signal indicating an LOS if the peak signal falls below an LOS threshold value. Col. 2, lines 21-41. The outputs of peak detector 203 and transition detector 201 of Loinaz are logically ORed to generate an LOS indicator. Col. 2, lines 52-57.

Loinaz teaches further that difference signals are sampled to generate decision circuit output signals, which are decisions of whether the sampled data is a logic '1' or a '0' based on comparison to a decision threshold signal. Col. 4, lines 51-35-50. The decision threshold signal of Loinaz may be set to the midpoint between logic '0' and logic '1', or the midpoint offset by a delta. Col. 1, lines 20-26; col. 4, lines 41-50. The decision circuit output signals of Loinaz are

used to generate inconsistency signals, which are then counted to determine an LOS condition. Col. 4, line 51- col. 5, line 10. Applicants respectfully maintain that the difference signals, decision threshold signals, and decision circuit output signals of Loinaz fail to teach or suggest signal strength magnitude, signal strength threshold levels, or indications as claimed. Applicants respectfully point the Examiner to at least the specification page 4, lines 8-24 and page 7, lines 12-20, which describe signal strength. Nowhere does Loinaz teach or suggest a counter circuit coupled to count according to an output of the sample circuit, as required by claim 30. For at least this reason, Applicants respectfully maintain that claim 30 distinguishes over Loinaz and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 30 and all claims dependent thereon, be withdrawn.

Regarding claim 42, Applicants respectfully maintain that Loinaz, alone or in combination with other references of record, fails to teach or suggest

> means for determining for a plurality of data bits of an input data stream whether a signal strength magnitude of each of the data bits is above or below a signal threshold level, means for determining that the loss-of-signal condition exists if a predetermined number of the data bits have a signal strength magnitude below the signal threshold level,

as required by claim 42. Applicants respectfully point the Examiner to Figures 1, 3, 4 and page 4, lines 9-16 which states:

> The loss-of-signal (LOS) system utilizes a sampled-data approach, which samples the input data at regular intervals and compares the magnitude of the sampled input data to a threshold signal strength level. If the number of samples that have a signal strength above the signal strength threshold exceeds a count threshold, then a LOS indication is not asserted. However, if the number of samples with signal strength greater than the threshold is less than the count threshold, then the LOS indication is asserted, thereby indicating that the LOS condition exists.

In addition, page 11, lines 16-17, of the specification states that "[e]ach time the high-speed register 115 samples the input it will output a digital high if the signal strength is greater than the LOS threshold." In contrast to claim 42, Loinaz teaches transition detector 201 that detects the number of 0-1 and 1-0 transitions and producing a high output signal if less than K transitions are detected over a specified time period, thus indicating a stuck-at-zero or stuck-at-one condition. Col. 2, lines 9-20. Loinaz also teaches a peak detector 203 that estimates a peak value of an input data signal, which is subtracted from an LOS threshold signal to generate an output signal indicating an LOS if the peak signal falls below an LOS threshold value. Col. 2, lines 21-41. The outputs of peak detector 203 and transition detector 201 of Loinaz are logically ORed to generate an LOS indicator. Col. 2, lines 52-57.

Loinaz teaches further that difference signals are sampled to generate decision circuit output signals, which are decisions of whether the sampled data is a logic '1' or a '0' based on comparison to a decision threshold signal. Col. 4, lines 51-35-50. The decision threshold signal of Loinaz may be set to the midpoint between logic '0' and logic '1', or the midpoint offset by a delta. Col. 1, lines 20-26; col. 4, lines 41-50. The decision circuit output signals of Loinaz are used to generate inconsistency signals, which are then counted to determine an LOS condition. Col. 4, line 51- col. 5, line 10. Applicants respectfully maintain that the difference signals, decision threshold signals, and decision circuit output signals of Loinaz fail to teach or suggest signal strength magnitude or signal strength threshold levels as claimed. Applicants respectfully point the Examiner to at least the specification page 4, lines 8-24 and page 7, lines 12-20, which describe signal strength. Nowhere does Loinaz teach or suggest means for determining that the loss-of-signal condition exists if a predetermined number of the data bits have a signal strength magnitude below the signal threshold level, as required by claim 42. For at least this reason, Applicants respectfully maintain that claim 42 distinguishes over Loinaz and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 42 and all claims dependent thereon, be withdrawn.

Regarding claim 43, Applicants respectfully maintain that Loinaz, alone or in combination with other references of record, fails to teach or suggest

> means for comparing signal strength magnitude of the sampled input data stream to a threshold signal strength level and means for asserting a loss-of-signal indication if a number of samples having signal strength less than the threshold signal strength level is less than a predetermined value, as recited by claim 43.

Applicants respectfully point the Examiner to Figures 1, 3, 4 and page 4, lines 9-16 which states:

> The loss-of-signal (LOS) system utilizes a sampled-data approach, which samples the input data at regular intervals and compares the magnitude of the sampled input data to a threshold signal strength level. If the number of samples that have a signal strength above the signal strength threshold exceeds a count threshold, then a LOS indication is not asserted. However, if the number of samples with signal strength greater than the threshold is less than the count threshold, then the LOS indication is asserted, thereby indicating that the LOS condition exists.

In addition, page 11, lines 16-17, of the specification states that "[e]ach time the high-speed register 115 samples the input it will output a digital high if the signal strength is greater than the LOS threshold." In contrast to claim 43, Loinaz teaches transition detector 201 that detects the number of 0-1 and 1-0 transitions and producing a high output signal if less than K transitions are detected over a specified time period, thus indicating a stuck-at-zero or stuck-at-one condition. Col. 2, lines 9-20. Loinaz also teaches a peak detector 203 that estimates a peak value of an input data signal, which is subtracted from an LOS threshold signal to generate an output signal indicating an LOS if the peak signal falls below an LOS threshold value. Col. 2, lines 21-41. The outputs of peak detector 203 and transition detector 201 of Loinaz are logically ORed to generate an LOS indicator. Col. 2, lines 52-57.

Loinaz teaches further that difference signals are sampled to generate decision circuit output signals, which are decisions of whether the sampled data is a logic '1' or a '0' based on comparison to a decision threshold signal. Col. 4, lines 51-35-50. The decision threshold signal of Loinaz may be set to the midpoint between logic '0' and logic '1', or the midpoint offset by a

delta. Col. 1, lines 20-26; col. 4, lines 41-50. The decision circuit output signals of Loinaz are used to generate inconsistency signals, which are then counted to determine an LOS condition. Col. 4, line 51- col. 5, line 10. Applicants respectfully maintain that the difference signals, decision threshold signals, and decision circuit output signals of Loinaz fail to teach or suggest signal strength magnitude, a threshold signal strength level, or indication as claimed. Applicants respectfully point the Examiner to at least the specification page 4, lines 8-24 and page 7, lines 12-20, which describe signal strength. Nowhere does Loinaz teach or suggest means for asserting a loss-of-signal indication if a number of samples having signal strength less than the threshold signal strength level is less than a predetermined value, as required by claim 43. For at least this reason, Applicants respectfully maintain that claim 43 distinguishes over Loinaz and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 43 and all claims dependent thereon, be withdrawn.

Claim Rejections Under 35 U.S.C. § 103

Claims 11-13 and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Loinaz as applied to claims 1, 9-10 and 30 above in view of U.S. Patent No. 6,492,929 B1 to Coffee et al., (hereafter, "Coffee"). Applicants believe that claims 11-13 and 36 depend from allowable base claims and are allowable for at least this reason.

Allowable Subject Matter

Applicants appreciate the indication of allowable subject matter in claims 17 and 38. Applicants believe that claims 17 and 38 depend from allowable base claims and are allowable for at least this reason.

In summary, claims 1-43 are in the case. All claims are believed to be allowable over the art of record, and a Notice of Allowance to that effect is respectfully solicited. Nonetheless, if any issues remain that could be more efficiently handled by telephone, the Examiner is requested to call the undersigned at the number listed below.

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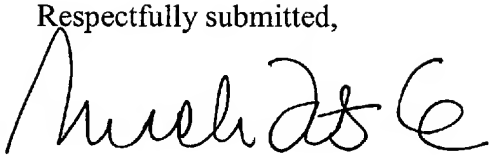
Respectfully submitted,



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